

EUROPEAN SYSTEMS INTEGRATION

TRENDS AND OPPORTUNITIES

INPUT



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# EUROPEAN SYSTEMS INTEGRATION TRENDS AND OPPORTUNITIES

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***European Systems Integration Trends and Opportunities***

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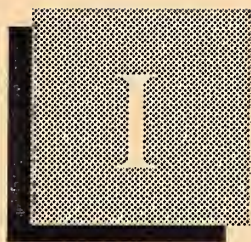
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# Table of Contents

<b>I</b>	Introduction	1
<b>II</b>	Executive Overview	3
<b>III</b>	European Systems Integration	5
	A. Developing Opportunities	7
	B. Strategies for Success	8
<b>IV</b>	The European Marketplace	11
	A. SI Market Development in Europe	15
	B. Overall Growth	17
	C. Development in Key SI Market Segments	17
	1. United Kingdom	17
	a. Defense Sector	19
	b. Government	21
	c. Manufacturing	22
	d. Banking and Finance	25
	2. France	27
	3. West Germany	28
	4. Italy	29
<b>V</b>	Conclusions and Recommendations	31

# Exhibits

<b>II</b>	-1	European Market Characteristics	4
<hr/>			
<b>III</b>	-1	Products/Services in SI Projects	7
	-2	Systems Integration—A Developing Opportunity	8
	-3	Systems Integration—Strategies for Success	9
<hr/>			
<b>IV</b>	-1	Commercial Systems Integration—Market Pressures	12
	-2	Systems Integration—Key Issues	13
	-3	The Evolution of Systems Integration	16
	-4	Schedule of Project Components—A Model	18
	-5	United Kingdom SI Market Forecast	19
	-6	MOD Expenditure with U.K.-Based Contractors, 1985-1986	20
	-7	U.K. Government Computer Services Purchasing Plans	22
	-8	The Manufacturing Environment Convergence on Flexibility	24
	-9	Continental European SI Market Forecast	27
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<b>V</b>	-1	Attractive Characteristics of CSI Approach	32
	-2	Systems Integration—Strategies for Success	33



# Introduction

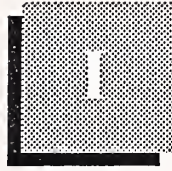




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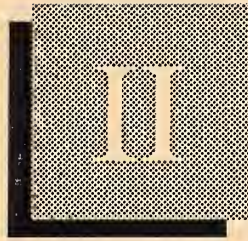
## Introduction

This report is a subset of the *European Professional Service Markets and Trends Opportunities Report*, which was a product of INPUT's 1987 comprehensive Information Service Programme - Europe (ISPE).

The focus of this publication is European Systems Integration. Many of our U.S.-based Systems Integration Planning Services clients have indicated an interest in this marketplace but normally would not have access to this information. INPUT is making this available for SIPS client review and use, in the belief it will be helpful in gaining a better understanding of the issues and challenges that in many cases are common to both the European and U.S. business environments. In addition the report will also help in understanding those issues that are unique to the European marketplace itself.

This publication is an unscheduled supplement to the market reports offered by INPUT in its Systems Integration Planning Service.



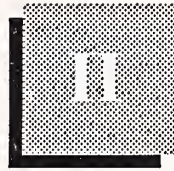


## Executive Overview









## Executive Overview

Systems Integration (SI) in the European Community is a new and emerging marketplace. INPUT estimated the 1987 market to be roughly \$355 million, with growth potential of \$2 billion by 1992.

Industry sectors that appear to have the greatest potential include banking and finance, manufacturing, and government. Example issues driving these trends are a competitive need for real-time information systems and the in-house inability to deal with complex systems while maintaining the current workload.

Although the SI market offers substantial growth and potential, it is important to appreciate its relationship to other professional services as noted in Exhibit II-1. Custom programming is a major element of systems integration, and the projected shift in market share between 1987 and 1992 is reflected accordingly.

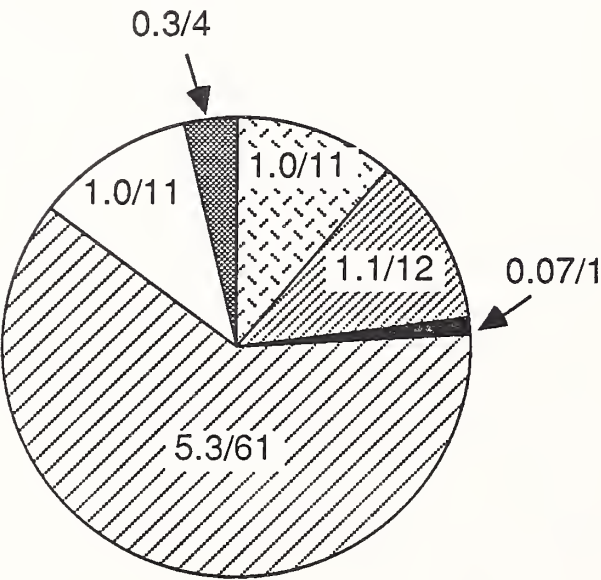
Vendors considering entering this market should have skill sets that combine publicly acknowledged expertise in an industry or an application area, quality long-term third-party relationships, and the ability to access, contain, and manage risk.

This report discusses these issues in detail and outlines the market potential on a geographical basis. INPUT will continue to track these business opportunities and report on their status in future publications.

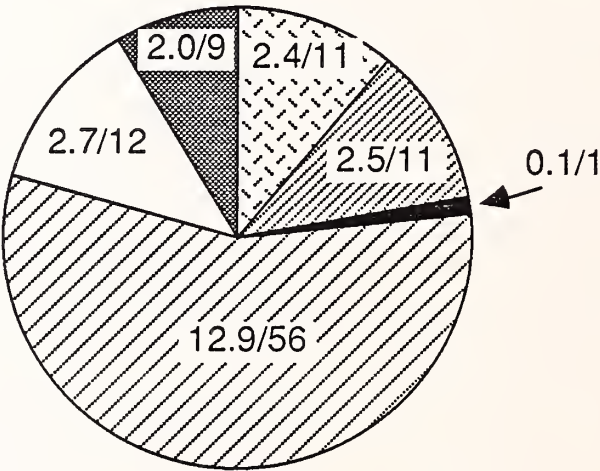
EXHIBIT II-1

EUROPEAN MARKET CHARACTERISTICS

(\$ Billions/Percent)

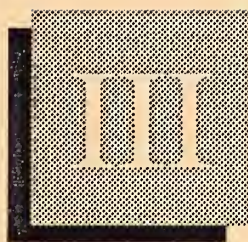


Total Market 1987  
\$8.7 Billion



Total Market 1992  
\$22.6 Billion

- |                |                             |                        |
|----------------|-----------------------------|------------------------|
| IS Consultancy | Facilities Management       | Education and Training |
| Contract Staff | Custom Software Development | Systems Integration    |

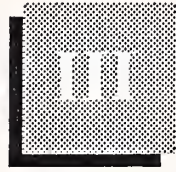


# European Systems Integration









# European Systems Integration Market

The term *systems integration* is relatively new in the European market. It has been perceived as “just another industry buzzword” by many vendor participants, and there is a lack of clear definition and understanding of this sector, which is not so much a new market but a change in approach toward subcontracting by users in the commercial sector.

Systems integration is best defined by describing the general market characteristics that are evident in this market sector. These can be described as follows:

- Systems integration is an approach to the development of new, upgraded, or expanded information systems for client organizations. In this approach, a vendor or team of vendors assumes responsibility for providing information services and products that result in a comprehensive solution to the client’s information systems problems.
- This approach is most applicable to major project efforts that involve the development of complex, multidisciplinary systems. The typical size of these projects, the fact that large portions of the software must be custom developed, and/or the substantial network requirements usually mean that the total project effort is multiyear.
- It involves not only the actual integration or interfacing of the components of the solution, but also:
  - The analysis of the problem
  - Design of the solution
  - Selection, development, and implementation of the hardware and software

- Such postimplementation support as testing, client staff training, documentation, and, in some instances, operation and maintenance of the newly developed system for a specified period of time.
- Generally, these projects are bounded at the start by the selection of the successful bidder and at the end by the acceptance of the new system by the client.
- Critical to the approach from both the client's and vendor's perspectives is the sharing or total transfer of responsibility (and risk) for the successful development of the system from the client organization to the vendor(s). In exchange for assuming the risks of failure to deliver the desired solution on time and within budget, the integrator receives not only management fees from the client but also markups from subcontractors and the "inside track" in providing any of the projects and services that compose the total solution.

Exhibit III-1 enumerates the component products and services that may be a part of a European SI project and from which the vendor can expect to receive revenue. Since each project is unique in terms of specific requirements, not all of these components are applicable to all SI projects. Further, the unique requirements dictate the proportion of the total project expenditures to be made for each component involved.

When conducting research for this report, INPUT discovered that the term *systems integration* was being used loosely within the industry, occasionally to describe relatively small (i.e., less than \$5 million in contract value), single vendor, time and materials-based, custom systems development projects.

INPUT has been careful to define this market and rapidly emerging business opportunity as comprising contracts valued at \$5 million or more in total, including the information systems and communications hardware.

INPUT's definition of the SI market for forecasting purposes includes defense as well as the commercial sector. It does, however, exclude specific projects related to NATO and the various space programs.

## EXHIBIT III-1

**PRODUCTS/SERVICES IN SI PROJECTS**

- Hardware
  - Information Systems
  - Communications
- Software Products
  - Systems Software
  - Applications Software
- Professional Services
  - Consulting
    - Feasibility and Trade-off Studies
    - Selection of Hardware, Network, and Software
  - Project Management
  - Design/Integration
    - Systems Design
    - Installation of Hardware, Network, and Software
    - Demonstration and Testing
  - Software Development
    - Modification of Software Packages
    - Modification of Existing Software
    - Custom Development of Software
- Other Miscellaneous Products/Services
  - Data Processing Supplies
  - Processing/Network Services
  - Data/Voice Communications Services

**A****Developing Opportunities**

Although the concept of SI has been around the European defense contracting community for almost 20 years, SI can be regarded as an emergent market opportunity (or approach towards doing business) in the commercial area since users are increasingly wanting to sign a single-source contract for a diverse development involving a number of subcontractors.

The dynamics of the market are changing with the increased importance of software development in large projects and the enhanced market position of key players in the SI market, such as Cap Gemini Sogeti, Logica, and Cap Group PLC. The hardware manufacturers are repositioning themselves to retain their position as a “natural first choice” for implementing large nonstandard turnkey systems. However, the specialist client knowledge and sophisticated software engineering skills of the software houses are enhancing their ability to act as prime contractors.

INPUT’s research reveals significant SI opportunities (Exhibit III-2) emerging in the banking and finance sector driven by deregulation and increased internationalism and competitiveness. Manufacturing is also offering SI opportunities, especially in the areas of process control, materials handling, and logistics management. Increasing pressure for efficiency and accountability and acute in-house staff shortage are also fostering opportunities in the government sector.

EXHIBIT III-2

### **SYSTEMS INTEGRATION A DEVELOPING OPPORTUNITY**

- A New Approach to Conducting Business in the Commercial Sector
- 44% AAGR 1987-1992
- Software Houses—An Increasing Role
- Target Industry Sectors
  - Finance and Banking
  - Manufacturing
  - Government

## **B**

### **Strategies for Success**

To succeed in the SI marketplace various strategies as noted in Exhibit III-3 are extremely important. As an example, it is advantageous to form lasting strategic partnerships that are difficult to compete against or break. It is also crucial for vendors to choose, at an early stage, partnerships that best serve their long-term strategic interests.

Containing the risk element and consciously managing each project to reduce the possibility of failure is an essential part of participation in the



market. Each project needs to be isolated in terms of financial control, organizational focus, management, and account control.

An SI vendor also needs to understand the processes that govern the fundamental business of the customer so as to be in a position to recommend work practice changes and guide the process of implementation of automation. This clearly means that expertise in systems design, productivity tools, project management, etc. is the second-most-important component of an SI vendor's makeup after a ground-level understanding of clients' real needs and business problems.

Systems integration is a big-stakes game for large international players. Typically, a vendor will spend up to 5% of the contract's value when bidding in preliminary systems evaluation, design, and bid support. Planning adequate funding and cultivating relationships with stakeholders is therefore an absolute necessity before entering the market.

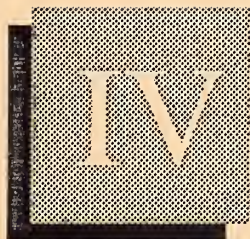
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EXHIBIT III-3

### **SYSTEMS INTEGRATION STRATEGIES FOR SUCCESS**

- Publicly Acknowledged Expertise in Industry and Application Area
- Quality, Long-Term Third-Party Relationships
- Ability to Assess, Contain, and Manage Risk
- Funded and Disciplined Bid Preparation
- Complex Project Management Skills



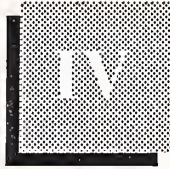


# The European Marketplace









## The European Marketplace

Systems integration was added to INPUT's professional services market as a separate delivery mode for the first time in 1987. The dynamics of the market are changing with the increased importance of software development in large projects and the increased financial stability, credibility, and international resources of software houses. In the past, the hardware manufacturers were a natural first choice when implementing large nonstandard turnkey systems. Software and services companies are now a natural potential choice for providing total solutions and a "one-stop shopping service" to corporate clients.

INPUT estimates that the SI market (which includes contracts of \$5 million and above but excludes NATO and space) will grow from a base of \$150 million in 1986 and \$325 million in 1987 to reach \$1.02 billion by 1989 at an AAGR of 90%. The five-year projection shows the market expanding to \$2 billion by 1992 at an AAGR of 25% for the period 1989-1992.

Exhibit IV-1 illustrates the key forces that are driving and inhibiting the development of this market.

Exhibit IV-2 illustrates the key issues that are impacting the European Commercial Systems Integration (CSI) marketplace.

There are a variety of pressures within the user environment that are driving demand for SI and can be highlighted as follows:

- International competitive pressure on quality and cost has increased markedly in recent years in most, if not all, industry sectors. The competition is not only working harder, but also working smarter, forcing European businesses to adopt new strategies for survival.
- To track their progress in these areas, there is an ever-increasing need for real-time information on a wide range of data, ranging from product

## EXHIBIT IV-1

**COMMERCIAL SYSTEMS INTEGRATION—MARKET PRESSURES**

- Market Drivers
  - Competitive Need for Real-Time Information Systems
  - Need for Integration of Single Application Systems
  - In-House Inability to Deal with Complex Systems While Maintaining Ongoing Systems
  - Need for On-Time, Successful Delivery within Budget
- Market Inhibitors
  - Unaggressive Management Not Seeking to Employ Leading-Edge Technology
  - Closed Attitudes toward Subcontracting
  - Inability of Many Commercial Organizations to Be Able to Specify Administrative Systems
  - Limited 'Project Manager' Resources
  - Vendor Inexperience
  - Lack of Adversarial Mentality

## EXHIBIT IV-2

**SYSTEMS INTEGRATION—KEY ISSUES**

- Strategic Alliances, Consortia, and Acquisitions
- Account Control
- Political Factors
- "Can Do" Attitude
- Industry Knowledge, As Well As Project Management and Integration Skills, Critical
- Risk Management
- Disciplined Bid Preparation

sales analyses and consumer credit verification to cash flow requirements and manufacturing capacity. As a result, companies now find information systems at the very heart of the organization and believe that new technologies will help them achieve the optimum systems solutions they require.

- However, most of today's systems were conceived in response to single applications needs. The vast majority of installed systems address single requirements and are therefore often fragmented and incomplete. What is needed is a system solution that integrates the data, text, and image processing needs of the corporation, one that fosters a better use of existing systems.
- These envisaged systems (if they can be defined and specified) are complex, however, and are frequently incompatible with existing hardware, software, and network systems. Furthermore, the in-house staff frequently lack both the time and the technical skills required to implement such complex solutions on time and within budget.
- Systems integration promises rapid and successful development of these very complex systems by allowing vendors skilled in complex systems implementation and management to take responsibility for the entire project, occasionally including ongoing maintenance and facilities management.

The major inhibitors to market development relate to cultural/managerial attitudes toward subcontracting and the inability of companies to effectively define their requirements for information systems.

There are problems to be overcome before the full potential of SI will be realized by vendors.

- Systems integration may require a company to turn over control of its entire information system to the integrator. Not only is this risky for the user on an operations basis, but also in the sense that the expertise for the system remains in the hands of the vendor, not the user.
- There is also the concern that the commercial market does not have the adversarial mentality that may be required for SI. In the defense sector, where the bidding and implementation processes are highly regulated, procedures exist to protect government agencies from the results of unsuccessful efforts. On the commercial side, however, these procedures do not exist, and even if they did, it is unlikely that a company would desire to suffer the bad press that might result from a lawsuit.
- A concern among some vendors is the lack of experience they have had in SI. Some efforts may call for a level of expertise in complex operating environments, for example, that few independent vendors have. While most vendors feel that is a benefit to be independent of a particular brand of hardware for the sake of objectivity, these vendors realize that this independence requires additional learning that may, in fact, not be readily available. The solution is multiple relationships between independent vendors and hardware manufacturers.

One of the key features of the European marketplace for SI and a central issue for participants is the need to form teaming agreements, joint ventures, and other consortia arrangements.

Strategic alliances are necessary, not only to share heavy bidding costs (especially in defense contracts), but also to combine the unique strengths of several vendors in terms of technical capability, marketing skills, and geographical presence.

Software houses need to carefully review their strategy on acquisitions in order to enhance their international market presence and capabilities vis-a-vis hardware manufacturers and other potentially significant market players.

The complexities of some development projects simply demand a team of vendors with recognized expertise in a multitude of disciplines. No single vendor currently has all of the capabilities required in these types of projects and few vendors have the buying power that comes from the economies of scale that are also frequently required.



Companies also face the political risks associated with the elimination of jobs that seem to be inevitable in such automation efforts. The tremendous cost of a large integration project can only be offset by the elimination of jobs. If these are union jobs, the problem only becomes compounded.

Systems integration offers an opportunity to seize account control from established vendors. Because of the initial importance of these systems to the end user and because the direction of SI contracts is multiyear, it affords the opportunity to the vendor to develop a unique relationship with the customer that can transcend existing relationships.

A key to vendor success in SI is a “can do” attitude often most clearly projected by the large American multinationals. Users are essentially purchasing the contractor’s ability to “make it happen.” The overriding importance is to have the image of being able to accomplish the task. In this respect, the hardware manufacturers have a competitive edge, in that users believe that IBM, DEC, Unisys, etc. “must” know how to implement complex systems.

Other critical success factors include:

- The ability to assess, contain, and manage risk, which includes sophisticated financial control procedures.
- In-depth understanding of clients’ business operations, needs, problems, and development strategy.
- Sophisticated and effective procedures for project management.

Disciplined bid preparation procedures are also a key requirement. Systems integration is a big-stakes game, and planning adequate funding before entering the market is therefore an absolute necessity.

## A

### SI Market Development in Europe

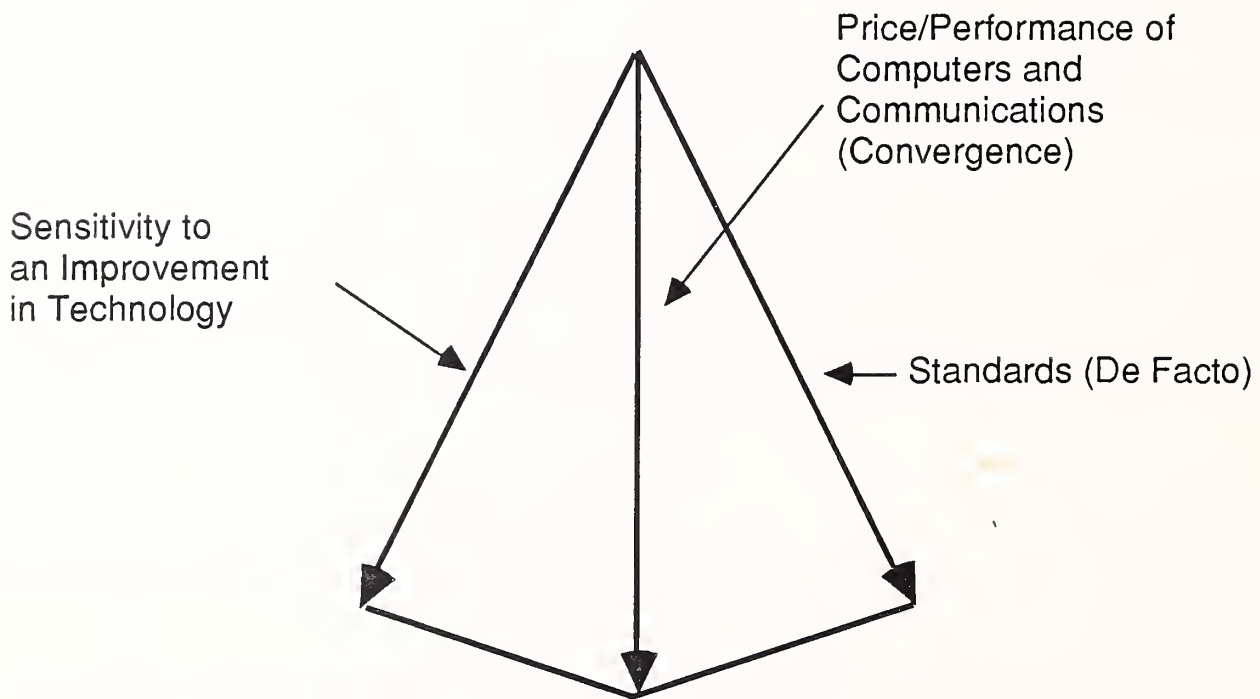
The concept of a European SI market is relatively new, and the overall market is immature. The number of significant SI contracts above the \$5 million level is currently fairly limited.

However, the market is rapidly developing almost as inexorably as information technology speeds through virtually every aspect of defense, business, and commerce. Data processing power can be delivered almost without restriction. The improvement in performance, size, power consumption, and overall capability is having a dramatic effect on civil and military systems.

Exhibit IV-3 illustrates one vendor’s view of the evolution of SI and indeed the dynamics of the competitive environment.

## EXHIBIT IV-3

## THE EVOLUTION OF SYSTEMS INTEGRATION



1970s	Dominance of Hardware Suppliers - Large Project Component (but Software Problems)
1980s	Hardware More a Commodity; Therefore Down in Importance. Software Up as a Component; More Important as Complexity Increases.
Mid-1980s	Software Houses More Important; Financial Strength and Pressure to Become Systems Integrators.



The priority has been to build up software expertise in keeping with the shift of the electronics industry away from hardware and toward software-based solutions.

Software houses such as CAP, Logica, and Cap Gemini Sogeti are already positioned to play an increasing role in the market. Enormous expertise in providing software engineering solutions has allowed software houses to assume ascendancy, to some extent, over the traditional electronics manufacturers in the defense sector and hardware manufacturers in the commercial sector.

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## B

### Overall Growth

As illustrated earlier, INPUT estimates that the Western European SI market (excluding NATO and space) will grow from a base of \$325 million in 1987 to reach \$1.02 billion by 1989. The five-year forecast estimates a market size of \$2 billion by 1992 and an AAGR of 25% for the period 1989-1992.

The forecast has been developed from a consolidation of awarded and projected SI contracts and the revenues apportioned over the projected contract duration.

Based largely on U.S. experience, INPUT has also developed a model for analyzing the revenue generated from SI contracts by project component over an average project life of four years. This model is illustrated in Exhibit IV-4.

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## C

### Development in Key SI Market Segments

#### 1. United Kingdom

The U.K. is currently the least immature of Western European markets with respect to acceptance of the SI approach toward subcontracting large systems development projects.

As illustrated in Exhibit IV-5, the market for contracts of \$5 million and above (i.e., 3.5 million pounds) will grow from \$60 million (40 million pounds) in 1986 to reach \$300 million (205 million pounds) by 1989 at an AAGR of 70%. The five-year forecast estimates a market size of \$500 million (340 million pounds) by 1992 at an AAGR of 19% for the period 1989-1992.

In 1986, the U.K. accounted for 40% of the Western European SI market. This proportion is estimated to fall to 29% by 1989 and 25% by 1992.

## EXHIBIT IV-4

### SCHEDULE OF PROJECT COMPONENTS—A MODEL

PROJECT COMPONENT	Year 1 (Percent)	Year 2 (Percent)	Year 3 (Percent)	Year 4 (Percent)	Total Component Expenditures (Percent)
Computer Hardware		100			28
Communications Hardware			100		8
Systems Software Packages		100			2
Applications Software Packages			100		4
Consulting	60	20	20		6
Project Management Fees	40	20	20	20	6
Design/Integration	45	35	20		11
Software Development		50	50		30
Education/Training and Documentation			33	67	2
Operation and Maintenance			33	67	2
Other Expenditures				100	1
Total					100

Note: These averages are based on U.S. experience.

## EXHIBIT IV-5

### UNITED KINGDOM SI MARKET FORECAST (\$ Millions)

SECTOR	1986	1987	1988	1989	1990	1991	1992
Defense	5	25	45	60	70	75	80
Civil Government	10	20	40	80	120	150	180
Manufacturing	15	25	35	40	45	50	60
Banking/ Finance	10	25	50	65	75	85	90
All Other	20	20	40	55	70	80	90
Total	60	115	210	300	380	440	500

#### a. Defense Sector

As illustrated in Exhibit IV-5, INPUT estimates that the U.K. SI defense contracting market will grow from a base of \$5 million in 1986 to reach \$60 million by 1989. The five-year forecast reveals a market size of \$80 million by 1992 and an AAGR of 26% for the period 1987-1992.

Defense contractors to the U.K. Ministry of Defense (MOD) have been facing a more stringent buying/contracting environment since the decision to phase out cost-plus contracting.

Since 1985, all large development contracts have been let on a fixed- and maximum-price basis, and responsibility for project management is given to a single prime contractor.

The Information Technology (IT) system content of defense procurement is steadily rising and becoming more critical. In particular, software development has been identified as a major problem in some current projects; e.g., Ferranti's Surface Ship Command System.

The increasing importance of software engineering skills has led to the emergence of software houses as prime contractors in this sector. Consequently, Logica, CAP, Scicon, Systems Designers, and Software Sciences have all emerged as significant players and are increasingly challenging the traditional electronics companies.

Exhibit IV-6 illustrates a league table of MOD expenditure placed with U.K.-based contractors for the period 1986-86, taken from the 1987 MOD statement on defense estimates.

EXHIBIT IV-6

### MOD EXPENDITURE WITH U.K.-BASED CONTRACTORS, 1985-1986

• Over £250M	GEC Plessey
• £100m - £250M	Ferranti Racal Thorn EMI
• £50m - £100M	STC (inc ICL)
• £25m - £50M	DEC Philips
• £10m - £25M	Control Data Hewlett-Packard Honeywell Systems Designers CAP Logica Scicon British Telecom IBM (U.K.)

Source: Statement on the Defence Estimates, 1987.

Examples of significant SI projects active in the U.K. defense sector include CHOTS (Computer HQ Office Technology Systems)—\$30 million, UNITER Network—\$40 million, and the FASTNET Army Communications Network—\$40 million.



Overall, there are significant opportunities for software houses in the defense sector, especially in the area of communications and upgrade of administrative systems by the military.

## **b. Government**

This sector represents a significant opportunity as a result of continuing difficulties in recruiting skilled and specialist staff and as a result of pressure to influence policy toward the support of U.K.-based service organizations.

As illustrated in Exhibit IV-5, INPUT estimates that this sector will grow from a base of \$10 million in 1986 to reach \$80 million by 1989, an AAGR of 100%. The five-year forecast shows the market expanding to \$180 million (125 million pounds) by 1992 at an AAGR of 30% for the period 1989-1992.

Government expenditure on computer systems is generally influenced (but it is not mandatory) by the Central Computer and Telecommunications Agency (CCTA). The group is currently part of HM Treasury; however, it would be more beneficial to the U.K. services industry if it were transferred to the DTI (Department of Trade and Industry) whose role is to support the development of U.K. industry both domestically and internationally.

Vendors interviewed by INPUT revealed a variety of problems in contracting to central government and dealing with the CCTA. A key difficulty is lack of understanding of prime requirements by government departments, which is not helped by shortage of training in stating operational requirements and writing contracts. This has led to constantly changing requirements for custom software development contracts and the habit of abandoning contracts.

Other serious difficulties include the problem of controlling projects remotely as the government retains overall control and the need to adapt to government procedures and culture.

However, there is a trend toward placing significant SI contracts because of the chronic shortage of key staff resources, lack of trained project managers, the need to improve accountability, increasing technological complexity, and increasing vendor selection.

An inhibitor on this sector is that in moving further toward external contracting, resistance from the trade unions may occur and is a key consideration for vendors when proposing facilities management components of an SI solution.

Exhibit IV-7 shows an analysis produced by the CCTA of the U.K. government's pattern of expenditure on external computer services. The budget year runs to the 5th of April each year.

EXHIBIT IV-7

<b>U.K. GOVERNMENT COMPUTER SERVICES PURCHASING PLANS</b>			
	£M		
	1985-1986	1986-1987	1987-1988
Consultancy	50	75	110
Software Development Contracts	40	60	90
Bureau	15	18	20
FM/SI	-	20	40
<b>Total</b>	<b>105</b>	<b>173</b>	<b>260</b>

The planned increase in expenditure on facilities management (FM) and systems integration (SI) is notable.

In total, the government spends over \$1.5 billion on computer systems, of which approximately 50% is spent on software development.

Examples of some significant SI projects that are currently active include the Government Data Network (GDN)—\$300 million (placed in Autumn, 1987), the Home Office Passport Project (PIMIS)—\$30 million, the Foreign and Commonwealth Office Automation System (FOLIOS)—\$15 million, and the Local Office Project for the DHSS.

### c. Manufacturing

Outside the defense and aerospace industries there has, as yet, been limited major capital investments in Computer Integrated Manufacturing (CIM) or Advanced Manufacturing Technology (AMT), as some pundits prefer to call it.

Despite the strong support of the U.K. Department of Trade and Industry and heavy research spending under the Alvey program, the current status of adoption of CIM technology in the U.K. could be generalized as limited with the major international players having implemented "islands of automation" rather than total CIM solutions.



A key objective for manufacturing companies has become not simply quality or low cost but also flexibility as firms seek to differentiate via customization while retaining economies of scale.

An international trend is the move toward Flexible Manufacturing Systems (FMS) focused toward low-volume/high-value as well as high-volume product lines.

As illustrated in Exhibit IV-8, the ultimate ambition is to develop flexible manufacturing processes that offer the best of both worlds: the customization possible with CNC machines coupled with the unit costs that can be achieved on dedicated transfer lines.

Key drivers of this trend are increasing international competitiveness caused by the need to capture significant international market shares with shortening product life cycles.

It is estimated that by 1990, the number of FMS in use will be 35 in the U.K., 70 in West Germany, 45 in France, and 30 in Italy.

There is no doubt about the benefits of this approach. For example, Rolls Royce's aero engine plant in Derby repaid a \$6 million investment in 12 months, boosted productivity by 40%, cut work in progress by two-thirds, and reduced the time taken from receipt of an order and delivery from six months to six weeks.

Another key objective for companies in this sector is to move toward Just-in-Time (JIT) inventory control. U.K. industry is estimated to have \$25 billion tied up in inventories, and the potential savings could fund very significant investments in CIM technology. Companies have already prioritized the implementation of the BS5750 standards for good manufacturing practice, and there are increasing opportunities for vendors to support automation initiatives in this area.

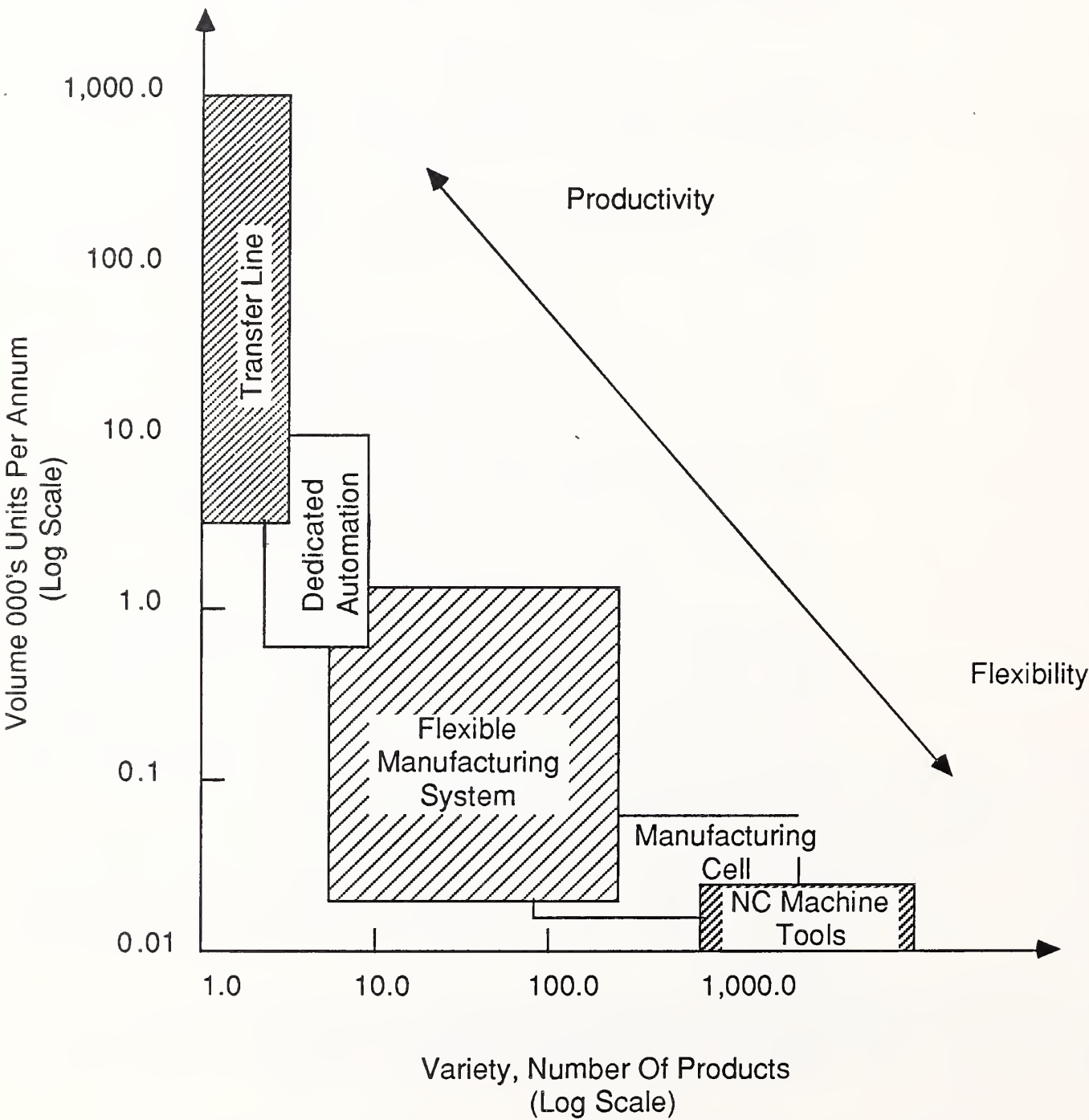
However, levels of overall expenditure on computer systems development are currently relatively modest in manufacturing and rarely exceed 3% of company turnover (a fifth of the expenditures of some financial institutions).

Nevertheless, INPUT's user research revealed high levels of priority being placed on process control, distribution/logistics systems, and communications networks in this sector.

It is anticipated that there will be a steady flow of opportunities for integrators, and the U.K. software houses CAP and Systems Designers have already developed significant process plan monitoring and materials-handling systems.

EXHIBIT IV-8

THE MANUFACTURING ENVIRONMENT  
CONVERGENCE ON FLEXIBILITY



Some examples of significant SI projects in this sector include Rolls Royce (Engine Testing System)—\$40 million, Jaguar (Diagnostics/fault location)—\$13 million, and Heinz (Process Plant monitoring)—\$10 million.

Growth, however, is not anticipated to be dramatic. In the U.K., it will require fundamental changes in management philosophy and culture before the market significantly develops. For implementing companies it requires an almost complete overhaul of an organization's strategy and working practices in every functional area. Simple technical issues such as acceptance of communication standards (e.g., MAP) still remain unresolved.

However, innovative, aggressively managed, internationally competitive organizations are increasingly seeking SI solutions, and with reference to Exhibit IV-5, INPUT estimates that the U.K. SI manufacturing market will grow from a base of \$15 million in 1986 to reach \$40 million by 1989 and \$60 million by 1992, at an AAGR of around 25%.

#### **d. Banking and Finance**

Organizations that are included in this market sector are:

- Banks/discount houses
- Credit institutions
- Investment institutions
- Auxiliary finance and banking services
- Insurance companies
- Building societies

Deregulation of the London markets, which culminated in the Big Bank of October, 1986, led to a flurry of mergers and acquisitions, global trading, falling margins, increased competition, and significant investments in information technology in order to enhance administrative efficiency and maintain market position.

A key trend in this market has been the move away from large batch or mainframe systems toward more flexible distributed data systems. Communications has significantly increased in importance, and there are substantial opportunities for converting batch processing systems to real-time transactions processing systems capable of handling increasingly large volumes of business.

Key areas of activity for computer system development in this market sector are:

- Dealing room systems (1987 expenditure estimated at around 600 million pounds)

- Back office and front office systems (e.g., bank branches)
- Banking systems and communications (e.g., ATM networks)
- EFT-POS, home banking, electronic cash management, and messenger services (e.g., CHAPS)

Dealing room systems, although involving a considerable degree of SI, are generally worth two million pounds or less for the computer system components.

Further expansion in this subsector is emerging in the insurance sector.

Another factor that is driving increased systems development expenditures is the replacement of systems hurriedly installed to meet Big Bank deadlines that are now considered inadequate.

In addition, concern with front office systems has led to a neglect of increasingly strained back office administrative systems. Growth in external contracting is being fueled by demands to integrate, update, and automate back office functions with front office customer interface activities.

The four major retail banks are highly profitable (despite the setbacks of LDC risk exposure) and are committing large expenditures in order to retain market position following the enactment of the 1986 Financial Service Act, which abolished many of the clearing banks' advantages over the building societies.

The 1987 pretax profit forecast for the four major retail banks is: Barclays—500 million pounds, Lloyds—200 million pounds, Midland—100 million pounds, and National Westminster—850 million pounds.

Although banking and financial services offer strong growth opportunities for service vendors, in general there is little evidence of vendors seeking to adopt an SI approach. This is despite the importance of communications systems to banks and the inherent difficulties in attracting the necessary expertise. To date, the banks still feel they can largely cope with this in-house.

However, the Trustee Savings Bank (TSB) has committed over 60 million pounds with Unisys over a three year period on hardware alone to automate its retail banking and back office settlement systems.

Again, with reference to Exhibit IV-5, INPUT estimates that the SI market in this sector will grow from \$10 million in 1986 to \$55 million by 1989, reaching \$490 million by 1992 at an AAGR of 44%.



## 2. France

The SI market in France is poised for growth, and significant vendors such as Sema-Metra and especially Cap Gemini Sogeti are well placed to take advantage of both commercial and defense-related SI contracts that are available to software houses.

Both organizations have strengthened their market positions in both domestic and international markets via acquisition and diversification. For example, Cap Gemini Sogeti's acquisition of 36% of CISI's interests and Sema-Metra's acquisition of CIM specialists, CERCI.

With reference to Exhibit IV-9, INPUT estimates that the French SI contract market will expand from a base of \$40 million in 1986 to \$230 million by 1989, reaching \$450 million by 1992 at an AAGR of around 40% for the period 1987-1992.

Significant contracts have included Annuaire Electronique—\$200 million and GSIT—\$30 million.

EXHIBIT IV-9

### CONTINENTAL EUROPEAN SI MARKET FORECAST (\$ Millions) (Major Country Markets—Totals Only)

COUNTRY MARKET	1986	1987	1988	1989	1990	1991	1992
France	40	80	150	230	310	380	450
West Germany	40	85	155	230	315	400	450
Italy	5	20	80	120	180	240	300

However, it must be noted that the French market does not necessarily present an easily addressable business opportunity for vendors not based in France because of the French chauvanistic culture.

French law forbids overseas companies from buying a French services company unless they have existing established businesses in France. For example, Logica fell foul of these regulations, but EDS was able to acquire SIP through its parent, GM.

In terms of market sector opportunities, INPUT predicts that significant SI contracts will be placed by the French government as a central element in the “dirigiste” strategy toward supporting domestic service companies. The central government sector accounted for approximately 18% of French services company revenues in 1986.

Deregulation, restructuring, and increased competition will also open up SI opportunities in the finance and banking sector from 1988 onward. There are also opportunities to be exploited in the public utilities sector. The planned upgrade of the French EFT-POS scheme also offers SI opportunities.

### 3. West Germany

With reference to Exhibit IV-9, INPUT estimates that the West German SI contract market will grow from \$40 million in 1986 to \$230 million in 1989, reaching \$450 million by 1992, at an AAGR of around 50%.

The key to this growth in the early stages is the demand for increasingly sophisticated automation among the West German manufacturing base.

Other opportunities are expected to arise as the federal government implements its current program of support for the development of IT within German industry.

Deregulation of the financial services community will lead to SI opportunities as new exciting players and new entrants seek to “catch up” with the demands of an increasingly competitive international environment.

Already, both the West German MOD and the Deutsche Bundespost (DBP) are known to have placed large SI contracts, and a more innovative approach toward public purchasing is anticipated for the future.

Currently, the West German information services market is dominated by the hardware manufacturers (i.e., Nixdorf, Siemens, and IBM), and the general attitude among West German companies has tended to favor an “antiservice” approach for systems development.

However, there is a future opportunity for integrators driven by the desire of user organizations not to contract directly with manufacturers because of their internal equipment prejudice.

Software houses could also have a significant role to play as subcontractors to the hardware manufacturers for SI contracts.

Non-German software houses could also have a significant role to play in the development of the West German SI market because of the fragmented nature of the West German software industry. There are a large



number of small players (in European terms), and many are owned overseas. In addition, existing domestic vendors are not oriented around solutions and concentrate on technologies; e.g., tools and data bases.

Indeed, a U.K.-based systems house commented that West Germany was "...a natural opportunity for systems integrators..." A major driving force for development is the shortage of skilled staff.

#### 4. Italy

With reference to Exhibit IV-9, INPUT estimates (tentatively) that the Italian SI market will grow from a base of only \$45 million in 1986 to \$120 million by 1989, reaching \$300 million by 1992 at an AAGR of 72% for the period 1987-1992.

In the manufacturing sector, large firms such as Olivetti are making significant investments in CIM (e.g, the Zinococelere plant) as part of a program of restructuring and international expansion. In addition, the state-owned telecommunications companies are anticipated to adopt an SI approach.

As yet, however, there is little evidence of SI contracts being placed in Italy. However, INPUT estimates that from 1988 onward, the market will develop rapidly from its base in defense into government and manufacturing.

Government policy is a key factor impacting market development. The adoption of innovative purchasing strategies by the state holding company IRI would have a very significant impact on a wide cross-section of the Italian commercial community.

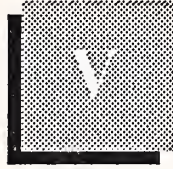




## Conclusions and Recommendations







## Conclusions and Recommendations

INPUT's research reveals that the size, complexity, and strategic value of systems development projects are increasing as users seek to exploit the benefits of digital computer technology across all the areas of their business and link them via communications.

From a user standpoint, this is leading toward requirements for new approaches to doing business, especially in the commercial sector, and vendors who are not already positioned as commercial systems integrators (and, indeed, those who already think that they are) must decide what their strategy is toward CSI, whether they enter the market themselves, partner with "prime" contractors, or operate a flexible arrangement of assuming "prime" and "subcontractor" roles.

From a user standpoint, there are many attractive characteristics of the CSI approach, and INPUT's research indicates significant opportunities developing in the government, manufacturing, and financial services sectors. The attractions to users of the CSI approach are summarized in Exhibit V-1.

To properly prepare for the CSI competitive environment over the next five years and beyond, vendors now must choose the envelope of services, industry market, and skills that will be the focus of their CSI efforts. They can then isolate those capabilities, products, and services that are needed to complement their own catalogue and begin selection of the ideal partner or partners that not only provide the skills needed but also enhance the vendor's public CSI image and the likelihood of obtaining business.

Successful vendors, such as CAP, are directing their envelope of services to carefully defined vertical markets, developing their market expertise as they go.

## EXHIBIT V-1

**ATTRACTIVE CHARACTERISTICS  
OF CSI APPROACH**

- Meet Business Objectives Rapidly
- Reduce Risk of Systems Development
- 'Acquire' Project Management Skills
- Integrate Fragmented Systems
- Save Costs over Internally Developed Systems
- Use New Technology to Achieve Optimum Solution

To succeed in CSI markets, it is necessary to form lasting strategic partnerships that are difficult to compete against or break. It is therefore crucial for vendors to choose, early on, partnerships that best serve their long-term strategic interests.

When selecting partners for CSI, vendors should review a potential partner's strategic fit in a matrix combination of industry knowledge, technical skills, financial strength, public reputation, managerial professionalism, application knowledge, geographical coverage, and cultural style. Since partnerships need to be formed on a long-term basis, this last factor, cultural style, needs careful consideration and may well inhibit vendors with a unique and idiosyncratic culture from effectively exploiting CSI opportunities.

Exhibit V-2 illustrates a list of factors that vendors have perceived as being critical to formulating a successful market development strategy with respect to CSI.

There are several key strategic elements to be considered in entering the CSI market. Containing the risk element and consciously managing each project to reduce the possibility of failure is an essential part of continued participation in the market. Each project needs to be isolated in terms of financial control, organizational focus, management and account control.



## EXHIBIT V-2

**SYSTEMS INTEGRATION—STRATEGIES  
FOR SUCCESS**

- Quality, Long-Term, Third-Party Relationships—Cultural Fit
- Envelope of Services, Industry Targets, and Skills
- Publicly Acknowledged Expertise in Industry and Application Area
- Ability to Assess, Contain, and Manage Risk
- Funded and Disciplined Bid Preparation
- Complex Project Management Skills

The successful CSI vendor must have a ground-level understanding of the nature of the customer's business, both now and in the future, so as to be in a position to recommend work practice changes as well as simple automation. The second-most-important component of a CSI vendor's makeup includes systems design, development tools and methodologies, project management talent, etc.

This is the reason why market specialization is a must, not just a sensible marketing approach. It is also why the selection of relevant partners is so crucial to the success of the CSI vendor.

Lastly, CSI is a multi-million-dollar venture. Typically a vendor will spend up to 5% of the contract's value in bidding in preliminary systems evaluation, design, and bid support. A \$20 million CSI contract can cost up to \$1 million just to bid, with no assurance of success. Planning adequate funding before entering the market is therefore an absolute necessity.





